

IN THE CLAIMS

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1. (Currently Amended) An image sensor comprising:
- a monolithic substrate;
 - a CMOS image sensor on the monolithic substrate and adapted for defining an image signal photoelectrically converted in response to received light;
 - a frame memory on the monolithic substrate and adapted for receiving the image signal from the CMOS image sensor;
 - an array of non-volatile memory cells on the monolithic substrate and adapted for receiving and storing the image signal from the frame memory, wherein each memory cell stores a trapped charge; and
 - a patterned conductive layer adapted to electrically interconnect areas of the monolithic substrate, the patterned conductive layer including:
 - a level of protective material fabricated over the array of non-volatile memory cells for blocking the light received by the CMOS image sensor so that the trapped charge is not erased from exposure to the light.
- capable of
2. (Original) The image sensor of claim 1 wherein each memory cell is a field effect transistor with a floating gate.
3. (Original) The image sensor of claim 1 wherein the level of protective material is polyamide.
4. (Previously Amended) The image sensor of claim 1 wherein the level of protective material is fabricated as part of the CMOS image sensor.
5. (Previously Amended) The image sensor of claim 1 wherein the level of protective material is a layer of metal fabricated as an interconnect for electrically connecting the CMOS image sensor and other circuits on the substrate.
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6. (Previously Amended) The image sensor of claim 1 wherein the CMOS image sensor comprises an active pixel array.

7. (Previously Amended) The image sensor of claim 1 wherein the CMOS image sensor comprises a passive pixel array.

8. (Currently Amended) An image sensor comprising:
a single integrated circuit;
a CMOS imager in the single integrated circuit and for defining an image in response to received light;
a non-volatile memory unit in the single integrated circuit and for storing the image, wherein the non-volatile memory unit is fabricated adjacent to the CMOS imager; and
a patterned conductive layer adapted to electrically interconnect areas of the single integrated circuit, the patterned conductive layer including:
a level of protective material fabricated over the non-volatile memory unit for blocking the light received by the CMOS imager.

9. (Original) The image sensor of claim 8 wherein the level of protective material is fabricated as part of the CMOS imager.

10. (Original) The image sensor of claim 8 further comprising a micro-controller for controlling transfer of the image from the CMOS imager to the non-volatile memory unit.

11. (Previously Amended) The image sensor of claim 10 wherein the non-volatile memory unit stores program code information for controlling the microcontroller.

12. (Original) The image sensor of claim 8 further comprising a digital signal processor for receiving and processing the image from the CMOS imager.

13. (Original) The image sensor of claim 8 wherein the level of protective material is a layer of metal.

14. (Original) The image sensor of claim 8 wherein the layer of metal is fabricated as an interconnect for electrically connecting the CMOS imager and other circuits on the substrate.

15. (Currently Amended) An image sensor comprising:

a single integrated circuit;

a CMOS imager in the single integrated circuit and for defining an image in response to received light;

a microcontroller in the single integrated circuit and for controlling the CMOS imager;

a non-volatile memory unit in the single integrated circuit and fabricated adjacent to the CMOS imager for storing program code or data; and

a patterned conductive layer adapted to electrically interconnect areas of the single integrated circuit, the patterned conductive layer including:

a level of protective material fabricated over the non-volatile memory unit for blocking the light received by the CMOS imager.

16. (Previously Amended) The image sensor of claim 15 wherein the non-volatile memory unit receives and stores the image.

17. (Original) The image sensor of claim 15 wherein the level of protective material is metal fabricated as an interconnect layer for electrically connecting other circuits on the single integrated circuit.

18. (Original) The image sensor of claim 15 further comprising a digital signal processor for receiving and processing the image from the CMOS imager.

19. (Currently Amended) A digital camera comprising:

a single integrated circuit;

a CMOS image sensor in the single integrated circuit and for defining an analog image signal photoelectrically converted in response to received light;

an analog to digital convertor in the single integrated circuit and for receiving and converting the analog image signal into a digital image signal;

a frame memory in the single integrated circuit and for recording the digital image signal;

a data compression/decompression unit in the single integrated circuit and for compressing the digital image signal provided by the frame memory;

a non-volatile memory unit in the single integrated circuit and for receiving the compressed digital image signal, wherein a patterned conductive layer adapted to electrically interconnect areas of the single integrated circuit, the patterned conductive layer including:

a layer of protective material is fabricated over the non-volatile memory unit for blocking the light received by the CMOS image sensor; and

a microcontroller in the single integrated circuit and for controlling the exchange of the digital image signal between the frame memory and the non-volatile memory unit.

20. (Original) The digital camera of claim 19 further comprising:

a digital signal processor for receiving and processing the digital image signal from the frame memory;

a digital to analog convertor for converting the digital image signal to an analog image signal, wherein the digital signal processor and the digital to analog convertor are fabricated on the single integrated circuit; and

an electronic view finder for viewing the image.

21. (Previously Amended) The digital camera of claim 19 wherein the non-volatile memory unit is fabricated adjacent to the CMOS image sensor.

22. (Previously Amended) The digital camera of claim 19 wherein the protective layer is fabricated as part of the CMOS image sensor.

23. (Original) The digital camera of claim 19 wherein the non-volatile memory unit stores program code information for controlling the microcontroller.

24. (Original) The digital camera of claim 19 wherein the protective layer is fabricated as a metal interconnect layer for electrically connecting circuits on the integrated circuit.

25. (Previously Amended) The digital camera of claim 19 wherein the CMOS image sensor comprises an active pixel array.

26. (Previously Amended) The digital camera of claim 19 wherein the CMOS image sensor comprises a passive pixel array.

27. (Currently Amended) A method of fabricating a CMOS imager on an integrated circuit with non-volatile memory comprising the steps of:

fabricating an array of non-volatile memory cells;

fabricating a light blocking and patterned electrically conductive layer over the array of non-volatile memory cells;

fabricating the CMOS imager for defining an image in response to received light; and

fabricating a frame memory for storing the image from the CMOS imager.

28. (Currently Amended) The method of claim 27 wherein the light blocking and patterned electrically conductive layer is a metal layer used as an interconnect for electrically connecting other circuits on the integrated circuit.